



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

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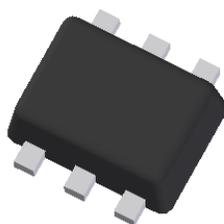
Features

- $BV_{CEO} > 40V$
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package
- Complementary PNP Type: NK-MMDT2907VQ

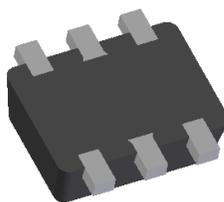
Mechanical Data

- Package: SOT563
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish. Solderable per MIL-STD-202, Method 208 **Ⓔ3**
- Weight: 0.003 grams (Approximate)

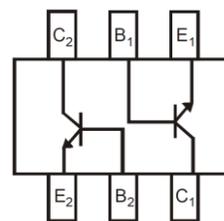
SOT563



Top View



Bottom View



Device Schematic
Top View

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	75	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	600	mA

Thermal Characteristics

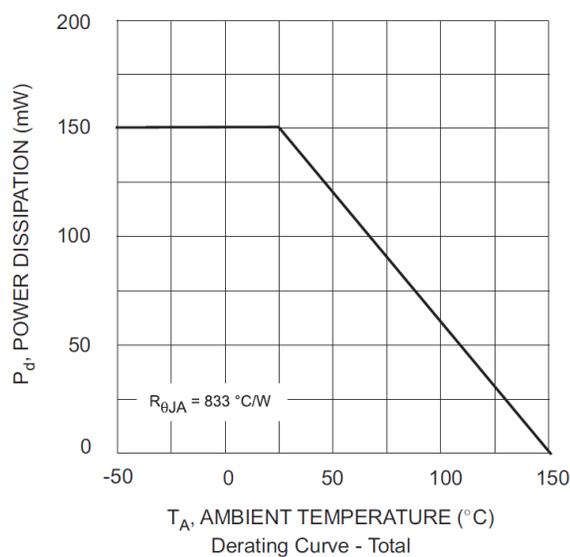
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	150	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Operating and Storage and Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 6)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristic and Derating Information

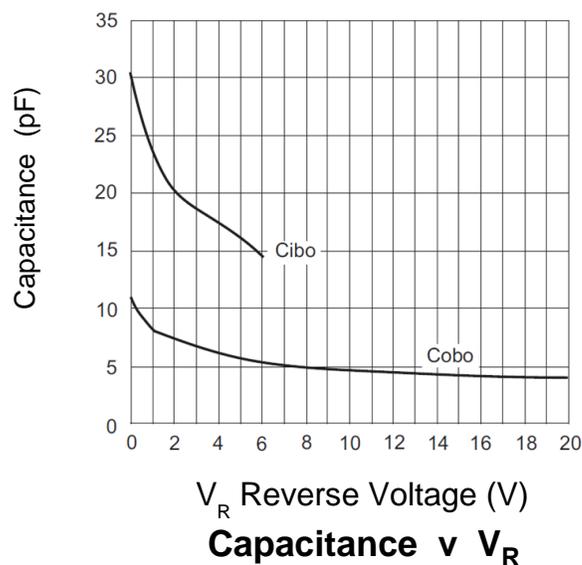
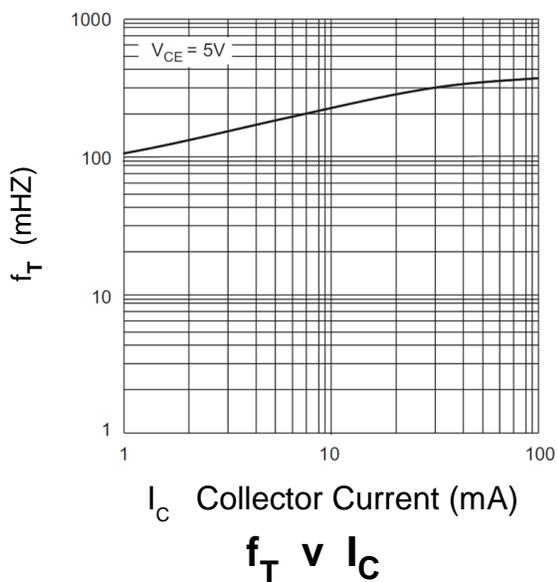
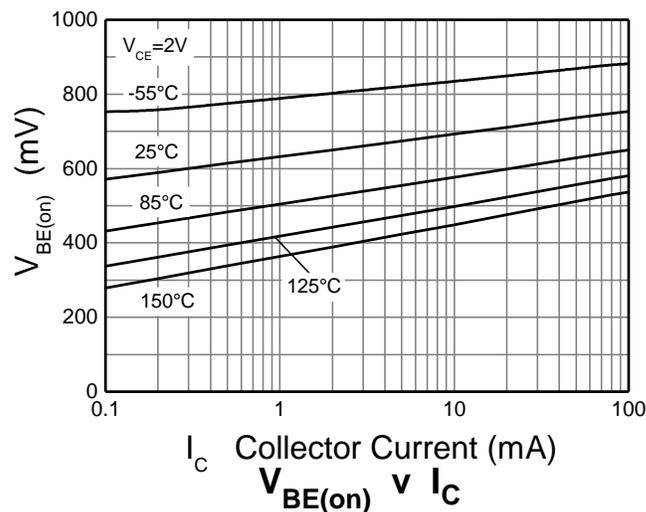
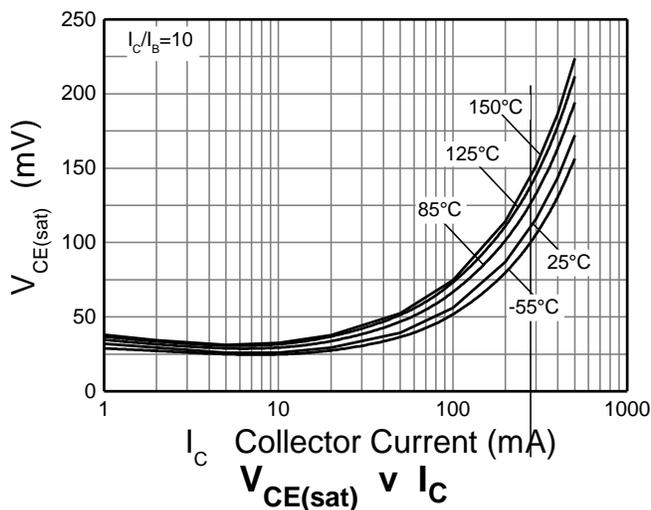
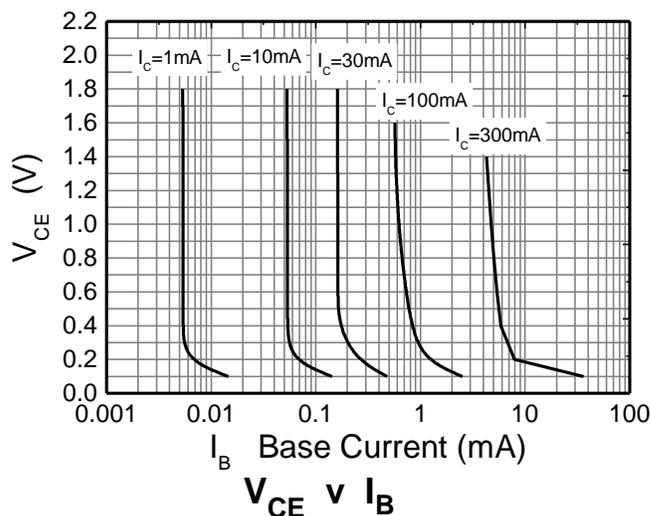
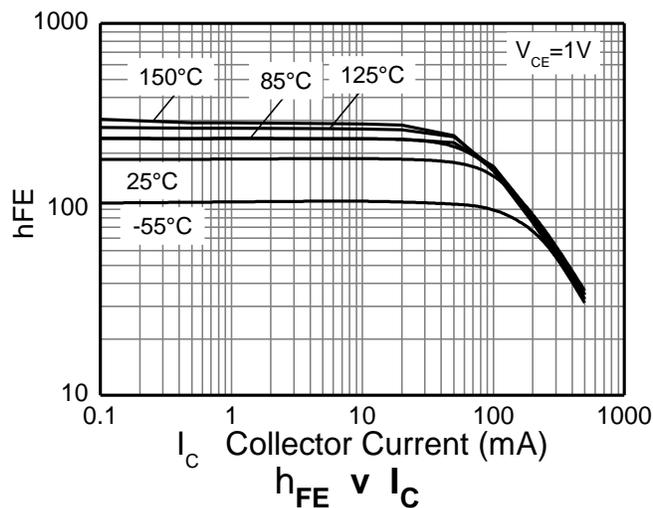


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

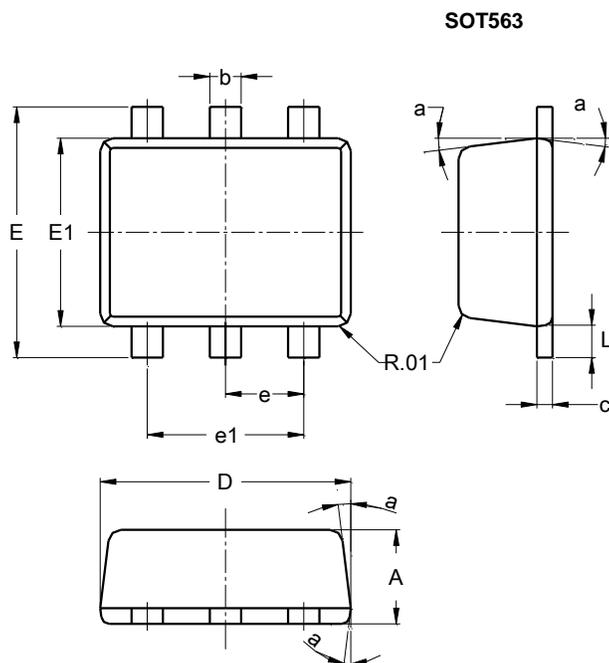
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage	BV_{CBO}	75	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	40	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	6	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	—	10	nA	$V_{CB} = 60\text{V}$
			10	μA	$V_{CB} = 60\text{V}, T_A = +150^\circ\text{C}$
Collector Cut-Off Current	I_{CEX}	—	10	nA	$V_{CE} = 60\text{V}, V_{BE(off)} = 3\text{V}$
Emitter-Base Cut-Off Current	I_{EBO}	—	10	nA	$V_{EB} = 5\text{V}$
Base Cut-Off Current	I_{BL}	—	20	nA	$V_{CE} = 60\text{V}, V_{BE(off)} = 0\text{V}$
ON CHARACTERISTICS (Note 7)					
DC Current Gain	h_{FE}	35	—	—	$I_C = 100\mu\text{A}, V_{CE} = 10\text{V}$
		50	—		$I_C = 1\text{mA}, V_{CE} = 10\text{V}$
		75	—		$I_C = 10\text{mA}, V_{CE} = 10\text{V}$
		100	300		$I_C = 150\text{mA}, V_{CE} = 10\text{V}$
		40	—		$I_C = 500\text{mA}, V_{CE} = 10\text{V}$
		50	—		$I_C = 10\text{mA}, V_{CE} = 10\text{V}, T_A = -55^\circ\text{C}$
		35	—		$I_C = 150\text{mA}, V_{CE} = 1\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	0.3	V	$I_C = 150\text{mA}, I_B = 15\text{mA}$
			1.0		$I_C = 500\text{mA}, I_B = 50\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	0.6	1.2	V	$I_C = 150\text{mA}, I_B = 15\text{mA}$
		—	2.0		$I_C = 500\text{mA}, I_B = 50\text{mA}$
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	8.0	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}, I_E = 0$
Input Capacitance	C_{ibo}	—	25	pF	$V_{EB} = 0.5\text{V}, f = 1\text{MHz}, I_C = 0$
Current Gain-Bandwidth Product	f_T	300	—	MHz	$V_{CE} = 20\text{V}, I_C = 20\text{mA}, f = 100\text{MHz}$
Noise Figure	NF	—	4	dB	$V_{CE} = 10\text{V}, I_C = 100\mu\text{A}, R_S = 1\text{k}\Omega, f = 1.0\text{kHz}$
SWITCHING CHARACTERISTICS					
Delay Time	t_d	—	10	ns	$V_{CC} = 30\text{V}, I_C = 150\text{mA}$
Rise Time	t_r	—	25	ns	$V_{BE(off)} = -0.5\text{V}, I_{B1} = 15\text{mA}$
Storage Time	t_s	—	225	ns	$V_{CC} = 30\text{V}, I_C = 150\text{mA}$
Fall Time	t_f	—	60	ns	$I_{B1} = -I_{B2} = 15\text{mA}$

 Note: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

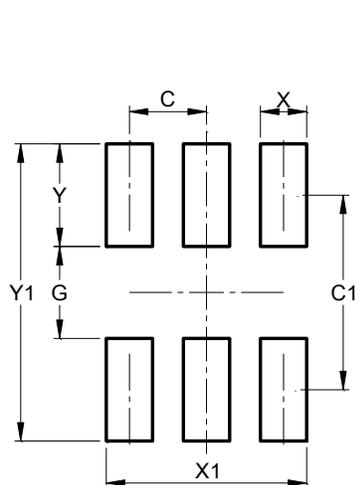


Package Outline Dimensions



SOT563			
Dim	Min	Max	Typ
A	0.55	0.60	--
b	0.15	0.30	0.20
c	0.10	0.18	0.11
D	1.50	1.70	1.60
E	1.55	1.70	1.60
E1	1.10	1.25	1.20
e	--	--	0.50
e1	0.90	1.10	1.00
L	0.10	0.30	0.20
a	8°	9°	7°
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.500
C1	1.270
G	0.600
X	0.300
X1	1.300
Y	0.670
Y1	1.940